

# Periodontal Microbiome

## Oral-Systemic Health Research Program

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Marshfield Clinic

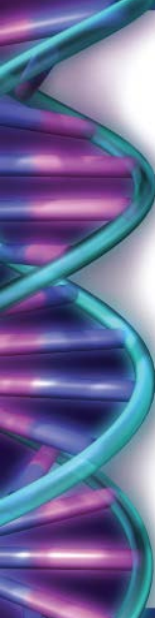


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# Personalized Medicine Research Project

- Population-based biobank with over 20,000 enrolled
- DNA, plasma and serum samples
- Access to medical records
- Ability to re-contact subjects
- Community Advisory Group, Ethics & Security Advisory Board, Scientific Advisory Board



**RESEARCH HAS LONG BEEN THE BASIS FOR IMPROVING MEDICINE AND HEALTH CARE.**

- In as little as 30 minutes, you can contribute to medical research.
- You will be compensated \$20 for your time.
- Over 14,000 central Wisconsin residents have already enrolled.


**WHAT IS, IN THE FUTURE, YOUR DOCTOR COULD:**

- prevent or detect which illnesses you or your family have or are likely to get and design a personalized health care plan to diagnose and treat early
- diagnose diseases accurately and use medications and other treatments that would work best for each individual
- need appropriately, avoiding medications that would cause you to have bad side effects

If you are 18 or over and living in one of these 19 ZIP codes you are eligible.

54405	54420	54437	54454	54484
54410	54421	54441	54465	54488
54412	54425	54446	54771	54489
54415	54436	54449	54479	

If you would like to learn more about Marshfield Clinic's Personalized Medicine Research Project, what it is and is not, and how to participate, ask your health care provider or call **715-319-7723** or toll free at **1-800-334-2222** to talk with one of our research coordinators. Appointments are not necessary. Walk-ins are welcome.



**PITTSVILLE FIRE DEPT.**  
MEMBER OF THE  
ST. BILLY'S

"When I found out about the personalized medicine program, I saw the project as a good thing for the future. If participating health care providers like me, we should be doing these things. It just kind of hand in hand with what we do here at the Marshfield Fire Department. We help people. There is some personal satisfaction in helping people."  
*— Don Jerry Mear*

Photo credit: Jim O'Connell, S.S. Walsh  
Photo credit: Lucy Hill, Jerry Mear, Paul Henshaw

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*Where the future of medicine lives.*

# Goals: Oral and Systemic Health Research Project

- Understand the connections between oral and systemic health, e.g., the mutual enhancement of periodontal disease and diabetes. Other common diseases linked to periodontal disease include heart disease, hypertension and osteoporosis and each has genetic and environmental risk factors.
- Understand the causes of oral diseases, such as periodontal disease and caries, e.g., determining the effect of genetics, diet, water source (well/city  $\pm$  fluoridation), and microbiome.
- Understand how improving oral health aids systemic health (comparative effectiveness) and bring PHC to the dental arena.

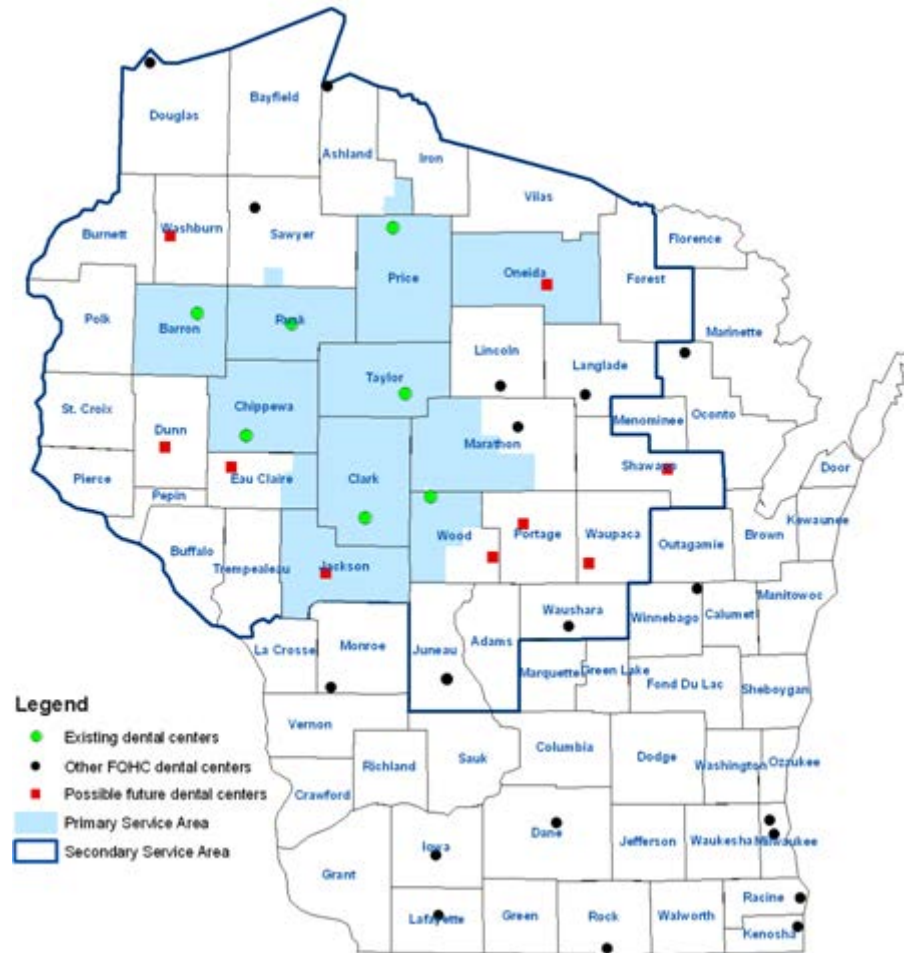


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# Primary and Secondary Target Areas

- 7 dental centers (2 more planned) providing dental services to people from all of Wisconsin's 72 counties
- 39 (FTE) dentists
- 30,680 unique dental patients [2010]
- 40,000 additional unique dental patients [2011]



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# Marshfield Clinic 2010 Data

## Medical and Dental Patient Breakdown

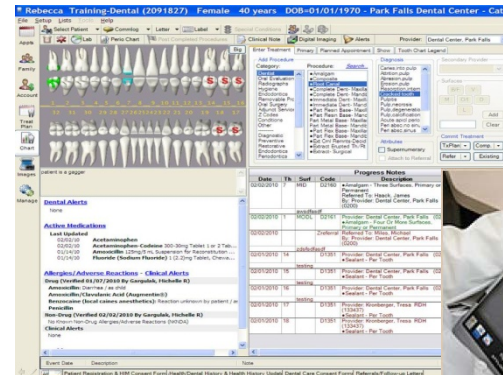
Medical Patients	189,530 (in VDW)
Dental Patients	70,393
Medical Patient (1 visit or more in year)	392,684 (141,922 in VDW)
Dental Patient (1 visit or more in year)	36,471 (30,680 w/ insurance data)
Both Medical & Dental Patient	26,221

\* 72% of Dental Patients are also Medical Patients

# Integrated Medical-Dental Electronic Health Record

An electronic dental record module integrated with electronic medical record, CattailsDental ↔ CattailsMD

Among the first in the nation to implement an integrated medical-dental electronic health record (iEHR) environment



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# Creating a Unique Research Resource

Personalized health care requires microbiome data

The resource will consist of:

A patient population with electronic dental and health records coupled with a comprehensive biobank (DNA, plasma, serum, standard periodic tests for fasting glucose, Hba1c and serum microalbumin, plus and periodontal microbiome characterization), plus questionnaire data on environment, diet, etc.

## Built upon PMRP

1500 subjects in PMRP are dental patients of the Marshfield Clinic  
As the Clinic's Electronic Health Record contains medical and dental care information, this research sub-cohort of PMRP can be used today to study the connections between oral and systemic health

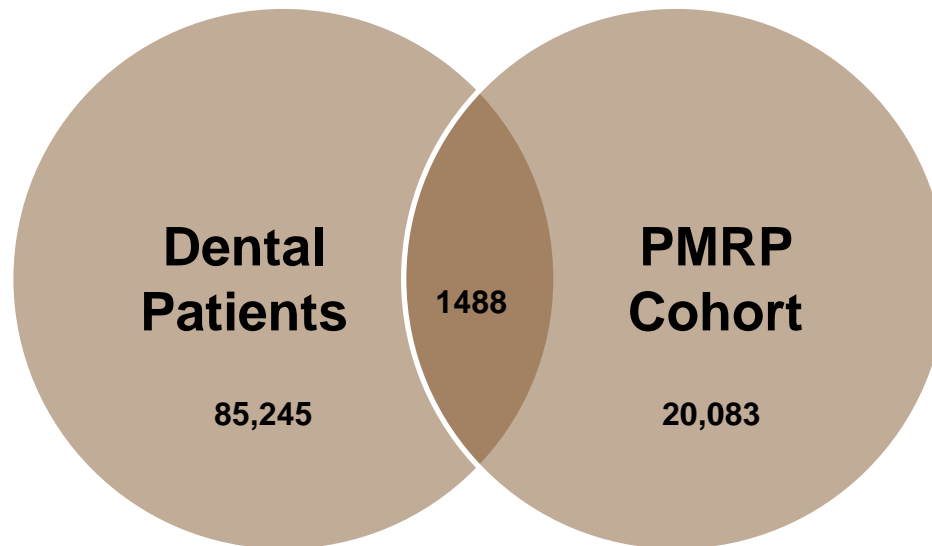


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# Oral Systemic Health Research Project (OSHRP)

- The vision is based on the success of PMRP and will be of complimentary value
- An oral systemic research committee has been formed and are currently working on pilot projects: two on diabetes
- There is already a cohort of 1488 patients in the OSHRP cohort and this number is increasing rapidly



November 2011



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Age category	Est. # Diagnosed (%)	Est. # Undiagnosed (%)	Est. Total Number (%)
Ages 18 – 44	79,930 (3.9%)	33,940 (1.6%)	113,870 (5.5%)
Ages 45 – 64	118,850 (8.2%)	50,470 (3.5%)	169,320 (11.7%)
Ages 65 +	95,940 (13.3%)	40,740 (5.6%)	136,680 (18.9%)
All ages adult *	294,720 (6.7%)	125,150 (2.9%)	419,870 (9.6%)

**Table 1: Diabetes Prevalence in Wisconsin [18].** \* Percent is age-adjusted (direct method) to the United States 2000 standard population. Total Percent may not equal the sum of diagnosed percent and undiagnosed percent, due to rounding.

# Management of Patients with Diabetes & Periodontitis

There were a total of 47,247 unique patients on whom we had both dental and medical data within the Integrated Medical-Dental Enterprise Data Warehouse.

- **8851** moderate to severe periodontal disease within 47,247 unique patients
- A total of **2752** diabetic patients within this group who had visited a medical provider within the last three years.
- **1858** Diabetics have had a dental visit in the last 1 year, however **894** diabetics have not had a dental visit within the last 1 year



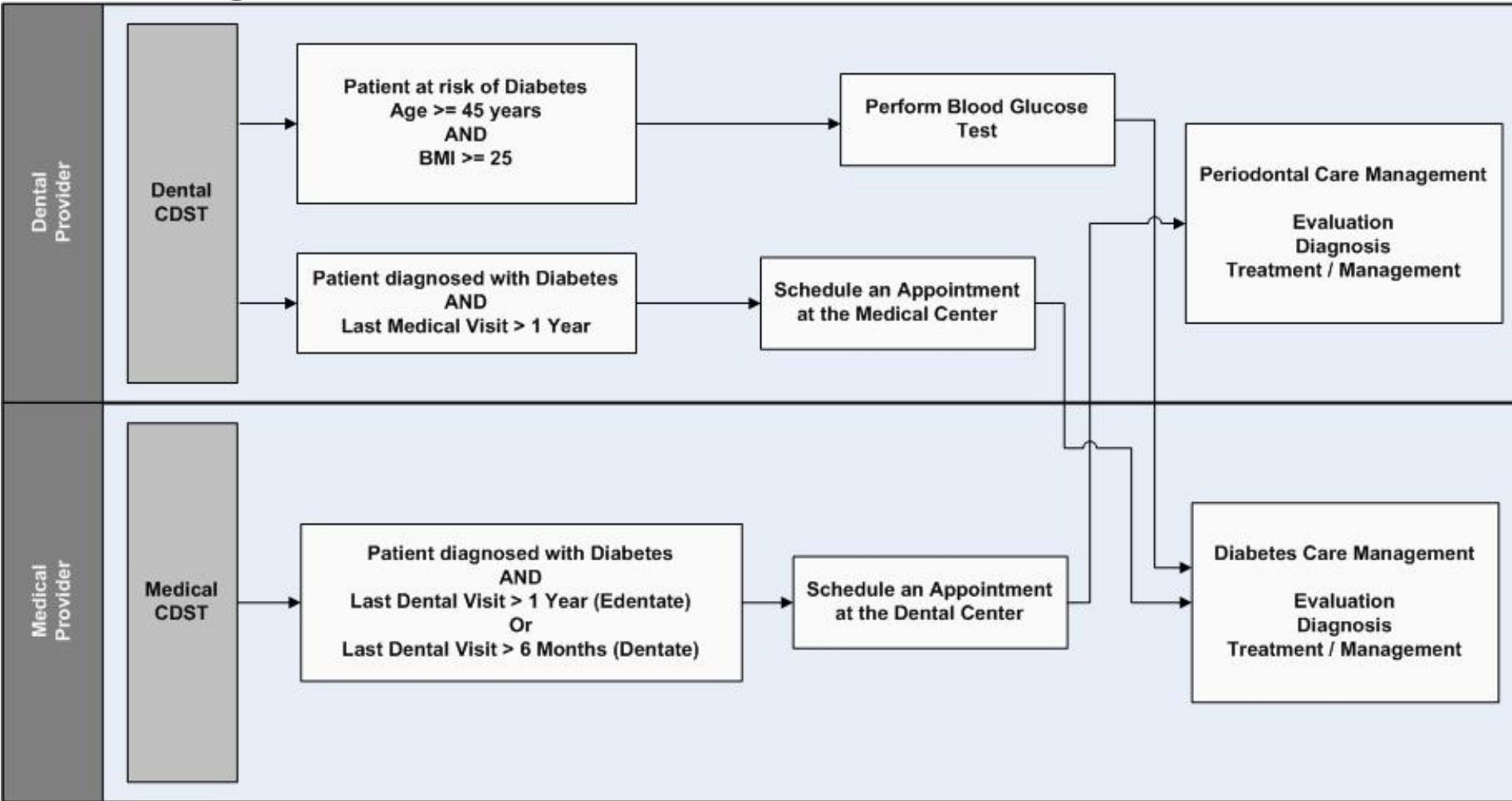
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Last Dental Visits by Med+Dental Population	<1yr	>1yr	>3y	Total
Dental Appointments	8,637	4,021	287	12,945
Hemoglobin A1c	1,137	562	44	1,743
LDL	3,034	1,539	116	4,689
HDL	3,257	1,629	121	5,007
Fasting Glucose	1,681	842	65	2,588
Random Glucose	4,509	2,231	178	6,918
<b>Diabetic</b>	<b>474</b>	<b>292</b>	<b>21</b>	<b>787</b>

Table y: Number of diabetics seen at Chippewa Dental Center

# Management of Patients with Diabetes & Periodontitis

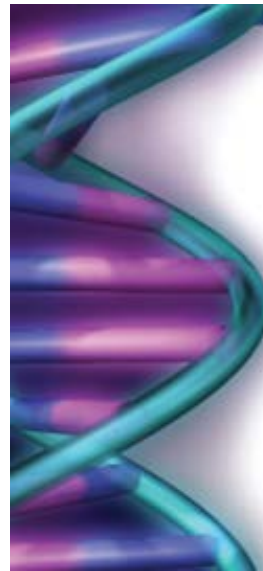


# Oral Systemic Health Research Project (OSHRP) The Microbiome-Genome-Phenome Project

EMR Data



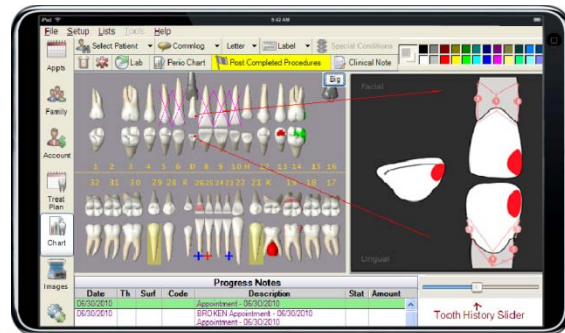
DNA Data



Blood & Serum Samples

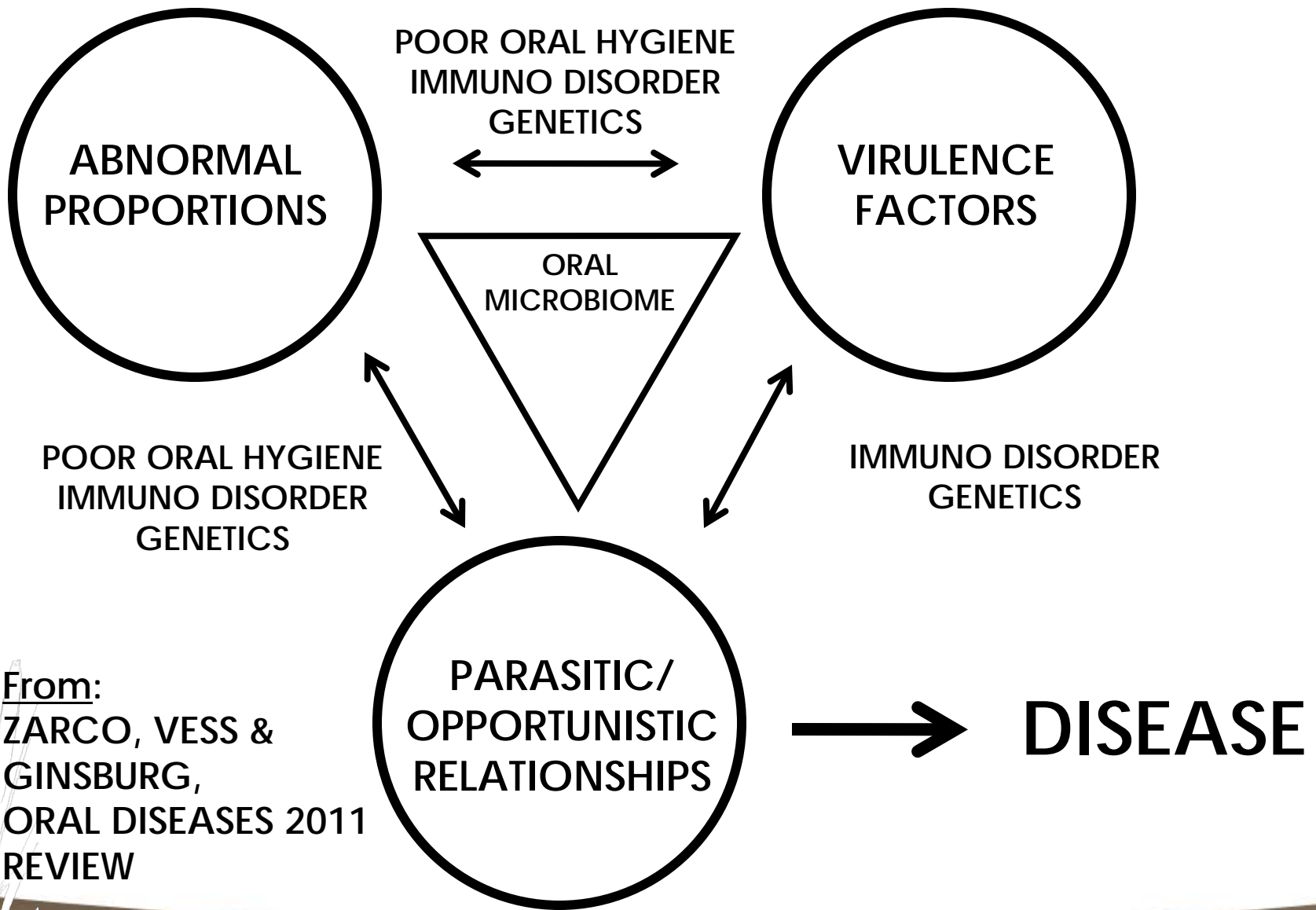


EDR Data



Oral Microbiome Samples





From:  
ZARCO, VESS &  
GINSBURG,  
ORAL DISEASES 2011  
REVIEW

Geisinger: dental services

Mayo: specialized dental services.

MCW: ?

University of Washington: dental school.

VA: dental services plus integrated EHR for its medical and dental services.

Harvard system: dental school

Univ of Chicago: ?

Univ of Alabama: dental school.

Northwestern: currently does not have dental services.

Johns Hopkins: specialized dental services. [/](#)

Loyola Univ: dental services

Mount Sinai: dental services

Duke: no dental services.

Univ North Carolina: dental school.

St Jude's: ?

Vanderbilt: dental services.

Cleveland Clinic: specialized dental services.

Univ of Maryland: dental school.